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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/777,664	02/07/2001	Sandhya Mishra	2001_0120A	9236

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[REDACTED] EXAMINER

MARX, IRENE

ART UNIT	PAPER NUMBER
1651	

DATE MAILED: 11/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No. <b>09/777,664</b>	Applicant(s) <b>Mishra</b>	
	Examiner <b>Irene Marx</b>	Art Unit <b>1651</b>	
<i>-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --</i>			
<b>Period for Reply</b>			
<p>A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.</p> <ul style="list-style-type: none"> <li>- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.</li> <li>- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.</li> <li>- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.</li> <li>- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).</li> <li>- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).</li> </ul>			
<b>Status</b>			
1) <input checked="" type="checkbox"/> Responsive to communication(s) filed on <u>Aug 28, 2002</u>			
2a) <input type="checkbox"/> This action is FINAL.      2b) <input checked="" type="checkbox"/> This action is non-final.			
3) <input type="checkbox"/> Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under <i>Ex parte Quayle</i> , 1935 C.D. 11; 453 O.G. 213.			
<b>Disposition of Claims</b>			
4) <input checked="" type="checkbox"/> Claim(s) <u>1-20</u> is/are pending in the application.			
4a) Of the above, claim(s) <u>1</u> is/are withdrawn from consideration.			
5) <input type="checkbox"/> Claim(s) _____ is/are allowed.			
6) <input checked="" type="checkbox"/> Claim(s) <u>2-20</u> is/are rejected.			
7) <input type="checkbox"/> Claim(s) _____ is/are objected to.			
8) <input type="checkbox"/> Claims _____ are subject to restriction and/or election requirement.			
<b>Application Papers</b>			
9) <input type="checkbox"/> The specification is objected to by the Examiner.			
10) <input type="checkbox"/> The drawing(s) filed on _____ is/are a) <input type="checkbox"/> accepted or b) <input type="checkbox"/> objected to by the Examiner. Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).			
11) <input type="checkbox"/> The proposed drawing correction filed on _____ is: a) <input type="checkbox"/> approved b) <input type="checkbox"/> disapproved by the Examiner. If approved, corrected drawings are required in reply to this Office action.			
12) <input type="checkbox"/> The oath or declaration is objected to by the Examiner.			
<b>Priority under 35 U.S.C. §§ 119 and 120</b>			
13) <input type="checkbox"/> Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f). a) <input type="checkbox"/> All b) <input type="checkbox"/> Some* c) <input type="checkbox"/> None of: 1. <input type="checkbox"/> Certified copies of the priority documents have been received. 2. <input type="checkbox"/> Certified copies of the priority documents have been received in Application No. _____. 3. <input type="checkbox"/> Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)). *See the attached detailed Office action for a list of the certified copies not received.			
14) <input type="checkbox"/> Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e). a) <input type="checkbox"/> The translation of the foreign language provisional application has been received.			
15) <input type="checkbox"/> Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.			
<b>Attachment(s)</b>			
1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)		4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____	
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)		5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)	
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____		6) <input type="checkbox"/> Other: _____	

The application should be reviewed for errors and conformity with domestic practice.

To conform with standard practice and for the sake of clarity, dependent claims should be amended to start with --The-- rather than "A".

Applicant's election of Group II, claims 2-20 in Paper No. 6 filed 8/28/02 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Claim 1 is withdrawn from consideration as directed to a non-elected invention.

Applicant's interpretation that the last Office action was non-final is correct. The error is regretted.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 is vague, confusing and indefinite in being incomplete in the absence of the ATCC accession numbers.

The units "°Be" or "°Be" render the claims confusing. It is unclear what is intended.

The phrase "namely" renders claims 4 and 17 indefinite because it is unclear whether the limitation(s) following the phrase are part of the claimed invention or not, and the resulting claim does not clearly set forth the metes and bounds of the patent protection desired.

Similarly, it is unclear whether the limitation(s) in the parenthetical recitations at least in claims 3, 7, 12, 15, 17 are part of the claimed invention or not, and the resulting claim does not clearly set forth the metes and bounds of the patent protection desired.

The “selection” process alluded to in claim 18 is not set forth with sufficient clarity. In claim 17, only “affinity for calcium ions” is required, without an indication of any particular selection process. Also the limitation in claim 18 “and can function most efficiently” appears redundant, since there is no indication as to how this effect is to be achieved.

Claim 14 is confusing in the recitation of 1,100,000 and 2,30,000 ppm. It is unclear what is intended by these figures.

The intended meaning of the parenthetical phrase “(autotrophic)” following “self-sustaining” at claim 20, viii) is not delineated with sufficient particularity. Is this an intended claim limitation?

In claim 20, iv) it is unclear whether “fresh weight” is dry or wet weight. In claim 20, condition vi) is unclear with respect to “brine of lower density where it oozes the calcium to its maximum”. The proposed method step is not delineated with sufficient particularity. In claim 20, item viii), the intended meaning of “cyanobacteria **with** euryhaline” is unclear in this context.

Claims 2-9 provide for the use of marine cyanobacteria, but, since the claims do not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claims 2-9 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 2-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Pillai.

The claims are drawn to a process of removing calcium ions from sea brine and sub soil brine using cultures of Cyanobacteria without specifying any process steps.

The reference teaches a process of removing calcium ions from sea brine using cultures of Cyanobacteria. See, e.g., page 98, paragraph 1; page 100, paragraphs 3 and 6.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heath *et al.* taken with Pillai *et al.* and Miller *et al.*.

The claims are drawn to a process of removing calcium ions from sea brine and sub soil brine using cultures of Cyanobacteria.

Heath *et al.* disclose a process of removing calcium ions from culture media by using Cyanobacteria of the genera *Anabaena*, *Nostoc* and *Synechococcus* (See, e.g., page 372, Table 2). The reference differs from the claimed invention in that the calcium ions are not removed from a brine. However Pillai discloses the cultivation of Cyanobacteria of many halotolerant species and *Phormidium* specifically, in a brine environment as well as the removal of calcium ions by the microorganisms. See, e.g., page 98, paragraph 1; page 100, paragraphs 3 and 6. In addition, Pillai demonstrates that at least strains of *Lyngbya*, *Oscillatoria* and *Spirulina* are well known in the art to be halotolerant and abundant in marine environments See, e.g., pages 90-91.

In addition, Miller *et al.* adequately demonstrate that it is well known in the art to use algae, including blue green algae or Cyanobacteria in a process of removing metals such as calcium from sea brine (See, e.g., col. 2, lines 27-52 and Example), wherein after treatment the calcium containing material is subjected to filtration. Subsequently, the biomass is disclosed as being useful as a feed additive and the filtrate useful for conversion into potable water (See, e.g., col. 3, lines 50-75).

Accordingly, one of ordinary skill in the art would have had a reasonable expectation of success in removing calcium ions upon treating sea brine with *Cyanobacteria*, including at least

members of the genera *Lyngbya*, *Oscillatoria*, *Anabaena* and *Spirulina* as disclosed by the references.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to modify the process Heath *et al.* for the removal of calcium ions from environments by using strains of blue-green algae (*Cyanobacteria*) from additional genera and subjecting sea brines and other brines to such treatment as suggested by the teachings of Pillai *et al.* and by using filtration to remove the biomass as suggested by the teachings of Miller *et al.* for the expected benefit of obtaining low calcium or calcium-free biomass suitable as a feed additive and low calcium or calcium-free water suitable for drinking.

Thus, the claimed invention as a whole was clearly prima facie obvious, especially in the absence of evidence to the contrary.

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irene Marx whose telephone number is (703) 308-2922. The examiner can normally be reached on Monday through Friday from 6:30 AM to 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn, can be reached on (703) 308-4743. The appropriate fax phone number for the organization where this application or proceeding is assigned is before final (703) 872-9306 and after final, (703) 872-9307.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Customer Service whose telephone number is (703) 308-0198 or the receptionist whose telephone number is (703) 308-1235.

  
Irene Marx  
Primary Examiner  
Art Unit 1651